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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,171	02/07/2002	Masaaki Hiroki	SEL 302	1313
7590 08/03/2007 COOK, ALEX, MCFARRON, MANZO, CUMMINGS & MEHLER, LTD. Suite 2850 200 West Adams St. Chicago, IL 60606			EXAMINER NGUYEN, KEVIN M	
			ART UNIT 2629	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/072,171	<b>Applicant(s)</b> HIROKI, MASA AKI	
	<b>Examiner</b> Kevin M. Nguyen	<b>Art Unit</b> 2629	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2006.  
2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-11 and 13-24 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2-11 and 13-24 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment/Arguments***

1. The amendment filed 5/21/2007 respect to claims 2, 3, 10, 11, 21-24 which is NOT entered. The reason is as follows:

In response to applicant's argument with respect to amended claims 2-11 and 13-24 recited "wherein a third voltage/another voltage is supplied to the pixel in the first subframe period." This argument is not persuasive because the applicant indicates that the amended claims are supported in the specification (see the remarks at page 9), which does NOT consistent with the current identified-below specification. These arguments are not persuasive because claims 2, 3, 10 and 11, three last lines recited "wherein a third voltage/another voltage is supplied to the pixel in the first subframe period" which is not comprehensive, and new subject matter. Otherwise, applicant must remove the above-identified claimed limitation in the reply to this Office action. The amendment is necessitated a new ground of rejection.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 2-11 and 13-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in

the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

4. Claims 2-11 and 13-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 2-11 and 13-24, the applicant indicates that the amended claims are supported in the specification (see the remarks at page 9). However, that indication of claims 2-11 and 13-24 does NOT consistent with the specification at page 9 recited "when an operator wants to display a 50<sup>th</sup> gradation, by applying a voltage for a 100<sup>th</sup> gradation to the first subframe and applying a voltage for a 0<sup>th</sup> gradation to the second subframe, the display of a 50<sup>th</sup> gradation, which results from the combination of the voltages applied to the first and second subframes, can be recognized through the operator's eyes."

Claims 2-11 and 13-24 do NOT consistent with the specification at page 10 recited "when an operator wants to display a 70<sup>th</sup> gradation, by applying a voltage for a 100<sup>th</sup> gradation to the first subframe and applying a voltage for a 40<sup>th</sup> gradation to the second subframe, the display of a 70<sup>th</sup> gradation, which results from the combination of the voltages applied to the first and second subframes, can be recognized through the operator's eyes."

How is a third voltage/another voltage (0<sup>th</sup> gradation voltage or 40<sup>th</sup> gradation voltage) supplied to the pixel in the first subframe period?

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 2, 3, 10, 11 and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamaguchi et al (US 6,222,515) hereinafter Yamaguchi.

7. As to claim 2, Yamaguchi teaches a method of driving a liquid crystal display device (see first embodiment of Figs. 1-15F, col. 5, line 40- through col. 9, line 37), comprising:

supplying a first voltage (2V, at least one Fig. 7B) of picture signals from a source driver (8, Fig. 2) to a pixel by first scanning signals (scanning signals from a scan driver 7, Fig. 2) of a gate driver (7, Fig. 4) in a first subframe period (a first field, Fig. 7, see col. 8, lines 11-27);

supplying a second voltage (4V, Fig. 7B) of the picture signals from the source driver (8, Fig. 2) to the pixel by second scanning signals (scanning signals from a scan

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driver 7, Fig. 2) of the gate driver (7, Fig. 4) in a second subframe period (a second field, Fig. 7, see col. 8, lines 11-27);

displaying one frame by displaying a first subframe and a second subframe [an average of 2V and 4V is (3V) is an image being displayed in one frame (the first and second fields), see Figs. 6 and 7B, col. 8, lines 11-15, and col. 8, lines 19-24];

wherein one frame period has the first subframe period and the second subframe period [the image of one frame (16.8ms) is divided into the first (8.4ms) and second fields (8.4ms) as shown in Fig. 6, col. 8, lines 13-15];

wherein one frame period has the first subframe period and the second subframe period are adjacent to each other [the first field and the second field are consecutive, see Fig. 7];

wherein the first voltage and the second voltage are different from each other throughout displaying the one frame [different voltage levels are applied to the first and second fields, respectively, and differences in mean effective voltage occurring in individual frames can realize more gray-scale levels than the gray-scale levels realized by applied data voltage. The image data of one display panel (the image data of one frame) can be displayed in a half time of one frame, see col. 8, lines 28-33, and col. 7, lines 43-45], and

wherein a third voltage is supplied to the pixel in the first subframe period (figure 18 of Yamaguchi further discloses that the grayscale voltage is 0 volt at a first field in a negative frame).

8. Claim 3 shares similar limitations to those included in claim 2 and therefore the rationale of rejection will be the same. Claim 3 has the added limitation "another voltage is supplied to the pixel in the first subframe period" (figure 18 of Yamaguchi further discloses that the grayscale voltage is 0 volt at a first field in a negative frame).

9. As to claim 10, Yamaguchi teaches a liquid crystal display device comprising:

plural pixels [a plurality of pixel "P", see Fig. 2, col. 6, lines 7-11];

a gate driving circuit [a scan driver 7, Fig. 2];

a source driving circuit for supplying picture signals to the pixels by scanning signals of the gate driving circuit [a data driver (upper and lower) 8, Fig. 2, col. 6, lines 17-19];

a liquid crystal whose transmittivity is changed dependently on the voltage of the picture signals supplied to the pixels [see col. 5, lines 58-61];

means for supplying voltage of picture signals from a source driver to a pixel by scanning signals of a gate driver in each of plural subframe periods [see Figs. 7A-7D, col. 8, lines 15-27];

means for displaying one frame by displaying plural subframes [an average of 2V and 4V is (3V) is an image being displayed in one frame (the first and second fields), see Figs. 6 and 7B, col. 8, lines 11-15, and col. 8, lines 19-24];

wherein one frame period (at least one frame, Fig. 7B) has the plural subframe periods [the image of one frame (16.8ms) is divided into the first (8.4ms) and second fields (8.4ms) as shown in Fig. 6, col. 8, lines 13-15];

wherein the plural subframe periods are adjacent to each other [the first field and the second field are consecutive, see Fig. 7];

wherein the supplied voltages in adjacent subframe periods are different from each other throughout displaying the one frame [different voltage levels are applied to the first and second fields, respectively, and differences in mean effective voltage occurring in individual frames can realize more gray-scale levels than the gray-scale levels realized by applied data voltage. The image data of one display panel (the image data of one frame) can be displayed in a half time of one frame, see col. 8, lines 28-33, and col. 7, lines 43-45]; and

“another voltage is supplied to the pixel in the first subframe period” (figure 18 of Yamaguchi further discloses that the grayscale voltage is 0 volt at a first field in a negative frame).

10. Claim 11 shares similar limitations to those included in claim 10 and therefore the rationale of rejection will be the same. Claim 11 has the added limitation “wherein a third voltage is supplied to the pixel in the first subframe period” (figure 18 of Yamaguchi further discloses that the grayscale voltage is 0 volt at a first field in a negative frame).

11. As to claims 22-24, figure 18 of Yamaguchi further teaches the grayscale voltage is 0 volt (a third voltage/another voltage is 0 gradation).

12. Claims 4-9 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Katakura et al (US 6,057,824) hereinafter Katakura.

As to claims 4-8 and 13-17, Yamaguchi teaches all of the claimed limitations of claims 2, 3, 10 and 11, except for the frames are 1/60, 1/120, 1/24, 1/48, 1/96 second.



As modified by Katakura reference, Katakura teaches the deficiencies of Yamaguchi in which a related LCD device includes the frame frequency 20-40Hz and the frame scanning frequency 60-120 Hz (corresponding to the frames are 1/60, 1/120, 1/24, 1/48, 1/96 second, see col. 17, lines 44-47).

As to claims 9 and 18, Katakura reviews in the related art that his invention relates to a display apparatus for use in a monitor, a video camera, a projector, a television, and a car navigation system (see col. 1, lines 10-13).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yamaguchi to become the frame frequency 20-40Hz and the frame scanning frequency 60-120 Hz (corresponding to the frames are 1/60, 1/120, 1/24, 1/48, 1/96 second) as conventionally disclosed by Katakura in order to achieve the benefit of providing display apparatus capable of a good halftone display while suppressing the flicker (see Katakura, col. 2, lines 3-5).

### ***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Mikami et al (US 6,825,826) hereinafter Mikami.

As to claim 19, Yamaguchi teaches all of the limitation of claims 2, 3, 10 and 11, except wherein the digital video data dividing circuit and the D/A converter circuit are

formed on the same substrate. As modified by Mikami reference, Mikami teaches the deficiencies of Yamaguchi in which a related LCD comprises a D/A circuit 207 within a data driver circuit 307 including a high-speed data bus 203 and low-speed data bus 102 divided into block. These circuits are formed by the CMOSTET fabricating process on a glass substrate 305 of the display apparatus in figure 3, column 5 and 6.

As to claim 20, Mikami teaches the divided circuits 203, 102, D/A converter 207, a scan driver circuit 210, and a plurality of pixels in a pixel unit 209 are formed on the common substrate, figure 3.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Yamaguchi to form the data driver circuit 307 including a high-speed data bus 203 and low-speed data bus 102 divided into block, and the D/A circuit 207 on the common substrate 305 as taught by Mikami. The motivation for doing so would result in an advantage of being able not only to reduce power supply current of the D/A converting circuits but also to obtain a liquid crystal driving voltage that is stable and exhibits a less error even if the wiring resistance is high. The reason for the latter is that it is possible to reduce a voltage drop in the power supply wiring (see Mikami, col. 10, lines 26-31).

**Conclusion**

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Nguyen whose telephone number is 571-272-7697. The examiner can normally be reached on MON-THU from 9:00-6:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on 571-272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*/Kevin M. Nguyen/*  
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July 24, 2007



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